SLEET.

The following are the dates on which sleet fell in the respective States:

Arkansas, 15. California, 1, 2, 3, 5 to 11, 13, 18, 19, 20, 28, 29. Colorado, 1, 2, 6, 7, 16, 30, 31. Connecticut, 5, 14. District of Columbia, 6. Idaho, 6, 9, 10, 13, 17, 19, 23 to 29. Illinois, 1 to 4, 7, 8, 9, 12, 13, 19, 20, 21, 23, 24, 28. Indiana, 1, 2, 3, 8, 13, 14, 23. Indian Territory, 3. Iowa, 1, 2, 4 to 7, 9, 11, 13, 21, 28. Kansas, 1 to 4, 6, 13, 14, 21, 22, 23, 31. Kentucky, 15, 24, 25. Maine, 3, 5, 9, 10, 21, 24, 28. Maryland, 4 to 7, 12, 13, 14, 24. Massachusetts, 5, 14, 20, 24. Michigan, 1 to 5, 8, 9, 13, 14, 19, 23, 25, 28, 29. Minnesota, 1, 4, 5, 8, 16 to 19. Missouri, 1 to 4, 7, 8, 11, 13, 21, 23, 25, 31. Montana, 18, 30. Nebraska, 4, 6, 7, 9, 18, 21, 30, 31. Nevada, 1, 2, 3, 5, 7, 8, 16, 17, 19, 28, 29. New Hampshire, 3, 5, 12, 20, 22. New Jersey, 5, 14, 24. New York, 1, 2, 5, 8, 13, 14, 22, 24. North Dakota, 8, 17, 20, 27, 28, 29. Ohio, 1, 2, 4, 5, 14, 20 to 25. Oklahoma, 2. Oregon, 4, 5, 8, 9, 10, 16 to 21, 27 to 31. Pennsylvania, 4, 5, 9, 12, 14, 20, 23, 24, 25, 27. South Dakota, 4, 7, 8, 11, 23, 24, 28. Tennessee, 12, 14, 15, 24. Utah, 1, 4 to 8, 12, 16 to 20, 28, 29, 30. Vermont, 2, 3, 5. Virginia, 5, 6, 9, 13, 14, 15. Washington, 4, 5, 7 to 11, 16 to 22, 25 to 27. West Virginia, 14. Wisconsin, 4, 5, 7, 8, 19, 29.

WIND.

The *prevailing winds* for March, 1897, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table VIII. These latter resultants are also shown graphically on Chart IV, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

HIGH WINDS.

Maximum wind velocities are given in Table I, which also gives the altitudes of the Weather Bureau anemometers above the ground. Maxima of 50 miles or more per hour were reported during this month at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Amarillo, Tex	19	52	w.	Erie, Pa	14	54	s.
Do	30	64	sw.	Fort Canby, Wash	17	66	s.
Atlanta, Ga	14	52	n.	Do	25	95	s.
Do	19	50	sw.	Do	27	82	s.
Buffalo, N. Y	5	54	w.	Lexington, Ky	5	50	sw.
Do	12	76	w.	New York, N. Y	13	52	nw.
Do	14	69	w.	Do	24	57	w.
Cairo, Ill	5	56	s.	Do	25	54	w.
Do	18	54	sw.	Northfield, Vt	6	50	nw.
Do	28	52	sw.	Portland, Oreg	25	55	s.
Cleveland, Ohio	5	50	se.	Port Huron, Mich	12	52	sw.
Do	12	52	w.	Do	14	50	sw.
Do	14	56	w.	Pueblo, Colo	31	54	nw.
Do	24	53	nw.	Tatoosh Island, Wash.	10	60	nw.
Dodge City, Kans	30	51	sw.	Do	25	60	w.
Eastport, Me	12	50	se.	Vicksburg, Miss	14	52	n.
El Paso, Tex	4	60	sw.	Winnemucca, Nev	28	66	sw.
Do	20	52	sw.	Woods Hole, Mass	12	56	s.
Do	28	51	w.	Do	25	60	w.
Do	30	56	nw.				

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 22 regular stations of the Weather Bureau by its photographic, and at 37 by its thermal effects; at one of these stations records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric records show seventy-fifth meridian time; for convenience the results are all given in Table X for each hour of local mean time. In order to complete the record of the duration of cloudiness these registers are supplemented by special personal observations of the state of the sky near the sun in the hours after sunrise and before sunset, and the cloudiness for these hours has been added as a correction to the instrumental records, whence there results a complete record of the duration of sunshine from sunrise to sunset.

The average cloudiness of the whole sky is determined by numerous personal observations at all stations during the daytime, and is given in the column "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table X.

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *durations* of effective sunshine whence the durations relative to possible sunshine are derived; the observers' personal estimates give the percentage of *area* of clear sky. These numbers have no necessary relation to each other, since stationary banks of clouds may obscure the sun without covering the sky, but when all clouds have a steady motion past the sun and are uniformly scattered over the sky, the percentages of duration and of area agree closely. For the sake of comparison, these percentages have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental records of percentages of durations of sunshine are almost always larger than the observers' personal estimates of percentages of area of clear sky; the average excess for March, 1897, is 8 per cent for photographic and 7 per cent for thermometric records.

The details are shown in the accompanying table, in which the stations are arranged according to the *total possible* duration of sunshine, and not according to the *observed* duration.

Difference between instrumental and personal observations of sunshine.

Stations.	Latitude.		Apparatus.	Total possible duration for the whole month.	Personal estimated area of clear sky.	Instrumental record of sunshine.			
						Photographic.	Difference.	Thermometric.	Difference.
	°	′		*Hrs.*	%	%	%	%	%
Tampa, Fla	27	57	T.	372.8	59	.....	.....	64	+ 5
Galveston, Tex	29	18	P.	372.6	35	35	0	.....	.....
New Orleans, La	29	58	T.	372.5	26	.....	.....	26	0
Savannah, Ga	32	05	P.	372.1	36	40	+ 4	.....	.....
Vicksburg, Miss	32	22	T.	372.1	54	.....	.....	54	0
San Diego, Cal	32	43	P.	372.3	57	68	+11	.....	.....
Charleston, S.C.*	32	47	T.	.....	36	.....	.....	.....	.....
Phœnix, Ariz	33	28	P.	372.3	77	83	+ 6	.....	.....
Atlanta, Ga	33	45	T.	372.3	22	.....	.....	26	+ 4
Los Angeles, Cal	34	03	P.	372.3	57	70	+13	.....	.....
Wilmington, N. C	34	14	T.	372.3	47	.....	.....	51	+ 4
Little Rock, Ark	34	45	T.	372.1	41	.....	.....	52	+11
Chattanooga, Tenn	35	04	T.	372.1	30	.....	.....	25	− 5
Santa Fe, N. Mex	35	41	P.	371.9	63	75	+12	.....	.....
Raleigh, N. C	35	45	T.	371.9	36	.....	.....	48	+12
Nashville, Tenn	36	10	T.	371.9	38	.....	.....	50	+12
Fresno, Cal	36	43	T.	371.7	66	.....	.....	63	− 3
Dodge City, Kans	37	45	P.	371.4	58	59	+ 1	.....	.....
San Francisco, Cal	37	48	T.	371.4	54	.....	.....	62	+ 8
Louisville, Ky	38	15	T.	371.4	32	.....	.....	47	+15
St. Louis, Mo	38	38	T.	371.4	32	.....	.....	46	+14
Washington, D. C	38	54	P.	371.4	49	58	+ 9	.....	.....
Kansas City, Mo	39	05	P.	371.4	43	43	0	.....	.....
Cincinnati, Ohio	39	06	T.	371.4	35	.....	.....	44	+ 9
Baltimore, Md	39	18	T.	371.4	43	.....	.....	50	+ 7

Difference between instrumental and personal observations.—Cont'd.

Stations.	Latitude.		Apparatus.	Total possible duration for the whole month.	Personal estimated area of clear sky.	Instrumental record of sunshine.			
						Photographic.	Difference.	Thermometric.	Difference.
	°	′		*H'rs.*	%	%	%	%	%
Atlantic City, N. J	39	22	P.	371.4	41	50	+9	.....	.....
Denver, Colo	39	45	P.	371.2	43	64	+21	.....	.....
Indianapolis, Ind	39	46	T.	371.2	36	.....	.....	51	+15
Philadelphia, Pa	39	57	T.	371.2	41	.....	.....	59	+18
Columbus, Ohio	39	58	T.	371.2	30	.....	.....	33	+3
Pittsburg, Pa *	40	32	T.	.....	34	.....	.....	.....	.....
New York, N. Y	40	43	T.	371.2	42	.....	.....	53	+11
Salt Lake City, Utah	40	46	P.	371.2	20	46	+26	.....	.....
Eureka, Cal	40	48	P.	371.2	36	43	+7	.....	.....
Cheyenne, Wyo	41	08	P.	371.2	49	58	+9	.....	.....
Omaha, Nebr	41	16	P.	371.2	32	42	+10	.....	.....
Cleveland, Ohio	41	30	T.	370.8	42	.....	.....	46	+4
Des Moines, Iowa	41	35	T.	370.8	37	.....	.....	40	+3
Chicago, Ill	41	53	T.	370.8	46	.....	.....	50	+4
Erie, Pa	42	07	T.	370.8	34	.....	.....	51	+17
Binghamton, N. Y	42	06	T.	370.8	37	.....	.....	38	+1
Detroit, Mich	42	20	T.	370.8	39	.....	.....	50	+11
Boston, Mass	42	21	T.	370.8	39	.....	.....	44	+5
Dubuque, Iowa	42	30	T.	370.8	42	.....	.....	41	−1
Albany, N. Y	42	39	T.	370.9	40	.....	.....	59	+19
Buffalo, N. Y. *	42	53	T.	.....	39	.....	.....	.....	.....
Rochester, N. Y	43	08	T.	370.9	42	.....	.....	44	+2
Idaho Falls, Idaho	43	29	T.	370.9	40	.....	.....	41	+1
Portland, Me	43	39	T.	370.7	43	.....	.....	58	+15
Northfield, Vt	44	10	P.	370.7	32	43	+11	.....	.....
Eastport, Me	44	54	P.	370.7	35	42	+7	.....	.....
St. Paul, Minn	44	58	P.	370.7	37	38	+1	.....	.....
Minneapolis, Minn	44	59	T.	370.7	.....	.....	.....	39	.....
Portland, Oreg	45	32	T.	370.3	31	.....	.....	27	−4
	45	32	P.	370.3	31	24	.....	.....	−7
Helena, Mont	46	34	P.	370.3	43	48	+5	.....	.....
Bismarck, N. Dak	46	47	P.	370.3	54	60	+6	.....	.....
Seattle, Wash	47	38	T.	370.1	36	.....	.....	46	+10
Spokane, Wash	47	40	P.	.....	34	.....	.....	.....	.....

*Record incomplete.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IX, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—The dates on which reports of thunderstorms for the whole country were most numerous were: 8th, 213; 9th, 152; 19th, 148; 21st, 189; 31st, 166.

Thunderstorm reports were most numerous in: Illinois, 174; Missouri, 250; Ohio, 165; Tennessee, 156.

Thunderstorms were most frequent in: Arkansas, Louisiana, South Carolina, 22 days; Mississippi, 25; Missouri, 23; Tennessee, 20.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 14th to the 22d, inclusive. On the remaining twenty-two days of this month 157 reports were received, or an average of about 7 per day. The dates on which the number of reports for the whole country especially exceeded this average were: 3d, 24; 4th, 37; 22d, 31; 28th, 20.

Auroras were reported most frequently in: Maine, 17; Michigan and New Jersey, 16; North Dakota, 48; Wisconsin, 19.

The number of reports was a large percentage of the number of observers in: Maine, 131; North Dakota, 123; New Hampshire, 69; Wisconsin, 33.

CANADIAN REPORTS.

Thunderstorms were reported as follows: Grand Manan, 24th; Ottawa, 20th; Port Stanley, 8th, 20th; Winnipeg, 29th; Esquimalt, 27th.

Auroras were reported as follows: St. Andrews, 4th; Father Point, 4th, 7th, 8th, 23d, 27th, 28th, 29th; Quebec, 4th, 8th, 29th; Montreal, 4th, 28th; Toronto, 22d; White River, 3d, 12th, 24th, 26th, 27th; Port Stanley, 22d; Port Arthur, 22d; Winnipeg, 1st, 3d, 10th, 12th, 21st to 26th, 28th, 29th; Minnedosa, 1st, 2d, 4th, 5th, 6th, 10th, 22d; Medicine Hat, 8th, 22d, 29th; Prince Albert, 5th, 22d, 27th, 28th; Battleford, 4th, 10th, 22d, 23d; Kamloops, 8th; Banff, 21st, 30th, 31st.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Snowfall and rainfall are expressed in inches.

Alabama.—The mean temperature was 60.0°, or 5.9° above normal; the highest was 89°, at Elba on the 13th, and the lowest, 22°, at Goodwater on the 1st. The average precipitation was 9.59, or 3.83 above normal; the greatest monthly amount, 20.83, occurred at Newburg, and the least, 4.29, at Livingston.—*F. P. Chaffee.*

Arizona.—The mean temperature was 50.3°, or 3.3° below normal; the highest was 94°, at Buckeye on the 19th, and the lowest, 10°, at Flagstaff on the 23d. The average precipitation was 0.66, or 0.43 below normal; the greatest monthly amount, 3.09, occurred at Pinal Ranch, while none fell at San Simon, and only traces at Potano and Tuba.—*W. T. Blythe.*

Arkansas.—The mean temperature was 56.0°, or 5.3° above normal; the highest was 88°, at Texarkana on the 21st and at Elon on the 30th, and the lowest, 13°, at Silver Springs on the 14th. The average precipitation was 9.72, or 4.91 above normal; the greatest monthly amount, 17.04, occurred at Moore, and the least, 4.93, at Texarkana.—*G. G. Harkness.*

California.—The mean temperature was 48.0°, or 5.0° below normal; the highest was 98°, at Volcano Springs on the 25th, and the lowest, 14° below zero, at Bodie on the 8th. The average precipitation was 3.98, or 0.55 above normal; the greatest monthly amount, 19.12, occurred at Bear Valley, while none fell at Needles, Ogilby, Palm Springs, Salton, and Volcano Springs.—*J. A. Barwick.*

Colorado.—The mean temperature was 30.9°, or 1.7 below normal; the highest was 78°, at Lamar on the 28th, and the lowest, 21° below zero, at Breckenridge on the 22d. The average precipitation was 2.37, or 1.14 above normal; the greatest monthly amount, 21.00, occurred at Ruby, and the least, 0.15, at Holly.—*F. H. Brandenburg.*

Florida.—The mean temperature was 70.6°, or nearly 4.0° above normal; the highest was 94°, at Archer on the 15th, and the lowest, 33°, at Fort Meade on the 26th. The average precipitation was 2.06, or 0.94 below normal; the greatest monthly amount, 8.64, occurred at Tallahassee, while none fell at Oxford.—*A. J. Mitchell.*

Georgia.—The average temperature was 59.2°, or 4.6° above normal; the highest was 90°, at Millen on the 22d, and the lowest, 23°, at Covington on the 27th, and at Diamond on the 28th. The average precipitation was 8.26, or 3.02 above normal; the greatest monthly amount, 13.31, occurred at Morgan, and the least, 4.12, at Quitman. At Fort Gaines 9.51 fell in twenty-four hours on the 23d.—*J. B. Marbury.*

Idaho.—The mean temperature was 27.8°; the highest was 67°, at Oakley on the 25th, and the lowest, 30° below zero, at Maryville on the 13th. The average precipitation was 2.51; the greatest monthly amount, 6.49, occurred at Idaho City, and the least, 0.10, at Blackfoot and Oakley. The month was stormy and unusually cold.—*D. P. McCallum.*

Illinois.—The mean temperature was 1.8° above normal; the highest was 79°, at Golconda on the 21st, and the lowest, 2° below zero, at Chemung on the 4th. The average precipitation was 5.96, or 3.18 above normal; the greatest monthly amount, 12.63, occurred at Cobden, and the least, 2.63, at Monmouth.—*C. E. Linney.*

Indiana.—The mean temperature was 42.5°, or 4.3° above normal;